Book Review

The Professional Pool Maintenance Manual by Terry Tamminen

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Terry Tamminen's The Professional Pool Maintenance Manual (published by TAB Books, a division of McGraw–Hill, Inc.) has stirred up quite a controversy in the industry since its release in late 1994. Many of the companies whose products or methods are described in the book have stated their disappointment in its lack of accuracy. When faced with the decision on selecting a reviewer for the book, the Journal of the Swimming Pool and Spa Industry choose to select one from the ranks of Mr. Tamminen's peers – not a manufacturer or builder but an experienced owner of a small company engaged in the same segment of the business as Mr. Tamminen – and the review is written from that perspective. Please note that a review is a statement of opinion, and is designed to inform the reader of the reviewer's opinion relative to the suitability of the book to its stated purpose, and the accuracy (in the opinion of the reviewer) of the information imparted.

Mr. Tamminen tackled a job of tremendous proportions when he set out to write his book, *The Professional Pool Maintenance Manual*, and I have great respect for the efforts and energies that went into its writing. It was, and still is, a job that needs to be done, and done well for the good of our industry as a whole. A person starting out in this industry as a service technician has had little or nothing to rely on for information to supplement or verify what he learns on the job from whoever may be training him. And very few of us (service technicians) have had the luxury of learning from a seasoned veteran. Most of us learned the majority of what we know from technicians with only a few years more experience than we had.

In his acknowledgments, the author credits his partner with teaching him all he knows. If this learning from a friend or associate that is so common in the swimming pool and spa industry has a drawback it is that many errors and misconceptions are passed from technician to technician and, yes, from generation to generation, with no means of correction. I must admit that I am as guilty as anyone can be in this respect. I have been embarrassed in the past when I found that some of my cherished "truths" were not true only after I had spouted them out for use in print.

The solution to these situations is to codify all of our knowledge on the subject of pools, spas, and water features into one definitive source for people to learn from and, as technology advances, to contest and change as needed. This is what Mr. Tamminen has tried to accomplish and I thank him for his efforts. It is therefore in the interest of helping the industry and with no personal malice that I point to the book's errors.

Priced at around fifty–five dollars, The Professional Pool Maintenance Manual would be a good buy if it could deliver good and accurate information. While there are a few other manuals available for slightly less money, they don't seem to cover as much ground as this book. The exception is the National Pool and Spa Institute's textbook, which still contains a few errors, but is much more expensive – in the hundred dollar range for NSPI members and substantially more for non–members.

On the surface the book is well written and quite readable. Aside from many backwards photographs the illustrations and photographs are mostly quite clear and well done. However the problem is the lack of technical accuracy, as evidenced by the specific examples which follow. The book would be a very useful tool if only the accuracy could be improved. Any serious observer will recognize the need for this kind of book at this point in the growth of the pool industry.

For some the most impressive part of the book may be the first paragraph of the introduction where Mr. Tamminen lists no less than twenty–two celebrities for whom he has rendered services. He continues by billing himself as the "Malibu Pool Man to the Stars." The back cover says he is "known throughout the pool and spa profession as the Malibu Pool Man to the Stars." At the end of the introduction he says that

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"until someone comes out with a better book, this is it." Unfortunately this is true. This is probably one of the most complete, though not accurate, books of its kind, and if nothing else the author must be commended for his initiative in even starting such a task.

It is also stated in the introduction that the book is designed for the pool and spa professional, but it appears that it is being marketed to the consumer in that it is offered for sale not only at book stores but at some retail mass merchandisers. If the marketing was to professionals I would assume that it would be marketed through pool and spa wholesalers, but I have not seen or heard of it there. Although it is logical for the publisher to sell the book to all available markets to make a profit, the issue of who is buying the book is an important point, because with the errors and misinformation involved I fear a disservice is being done to the consumer, and I wonder how the correct information can be communicated to the consumer. The service industry has established training programs offered by the manufacturers and other interested groups, where corrections may be offered. The consumer does not have this resource available, and may not realize that there is a problem with information in the book until and unless a professional becomes involved.

The publisher must also be taken to task for allowing this book to get to print in its present flawed form. With a list of four people on the editorial team at least one of them should have been a technical editor charged with checking some of the facts. Even a casual reading by a person with little or no specific knowledge of pools would show many discrepancies, such as the statement on page 250 that "calcium hypochlorite is unstable" followed by a chart only three pages later that lists the same chemical as being stable. (Whether addressing the issue of the chemical's volatility or the issue of its lack of pre–stabilization with cyanuric acid, it is unstable and the reference on page 253 is incorrect.) On page 304 we are told "don't add chemicals while filling [a] pool", only to be told three pages later that "small amounts of balancing chemicals" can be added and brushed to distribute them. On page 78, in a single paragraph we see that a starting motor draws either twice as much or five to six times as much current as a running motor. These are errors that should be caught by a non–technical editor, rather than requiring a service technician. Mr. Tamminen also makes general errors in the use of terms, such as using the term "current" in reference to electricity in place of term "voltage", and using the terms "sanitize" and "oxidize" interchangeably. These types of errors should be corrected if a future edition of the book is published. Another prevalent problem is the lack of distinction made between residential and commercial pools, and the distinction between acceptable, common, and illegal practices.

With all the companies listed in the acknowledgments it is hard to believe that there are so many errors of fact in the book. It appears that perhaps the companies were only asked for literature and did not have any real input When I was done reading the book and marking errors and questionable statements I found almost an error per page with a maximum of nine errors on one page in the Special Procedures section on replacing a skimmer. As many as four to six problems per page were evident in the Glossary, Heaters, and Basic Electricity sections.

Examples:

The following is a list of some of the errors in Mr. Tamminen's book. It is not a complete listing, but is intended to illustrate the types of misinformation the book contains.

p75: Mr. Tamminen claims that closed face impellers are "so efficient that a diffuser must be added to the design to slow the speed of the water before it leaves the volute." If this were the case we could simply remove the diffuser from any pump and increase the flow. But removing a diffuser results in less flow. Why? The answer can be obtained from virtually any engineer at any of the many pump manufacturers that supply the swimming pool industry. When water is drawn through an impeller it travels in a spiral due to friction between the impeller and the water. The diffuser consists of a set of vanes surrounding the impeller, which are set out at an angle greater than the angle at which the water is leaving the impeller (the spiral), causing much of the otherwise wasted spiraling motion to be transformed into an outward motion, in the same direction as the centrifugal force that moves the water to begin with. So we see that while the closed face impeller is very efficient, it is not too much efficiency that requires a diffuser, but it is the diffuser that works with the closed face impeller to deliver even more efficiency.

p80, 113, 454: The (by now) old but still much misunderstood concept of the "up–rated" motor is thoroughly covered and totally miss–stated in this manual. Quoting from his glossary: "The up–rated motor has a similar horsepower rating [as a full–rated motor] but will function to even higher standards if called upon." (p. 454) Anyone who has ever installed an up–rated motor on a full–rated pump of the same horsepower has quickly found that an up–rated motor will not even perform to the same standards as the full–rated motor, much less to "higher standards." On page 113 he suggests that "you might be able to get a ½ hp up–rated motor that is able to perform as well as a 1 hp full–rated motor." This means that ½ horsepower times a service factor of 1.2 or less must equal or exceed 1 horsepower times a service factor of 1.3 or more.

or: .5 x 1.2 ≥ 1 x 1.3

.6 ≥ 1.3 ????

Neither math nor experience will bear this out. In short a one horsepower up–rated pump and motor has one small difference from a *three–quarter* horsepower full–rated pump and motor–the label.

or: 1.0 x 1.13 = .75 x 1.5

1.13 = 1.13

p 99: In figure 4–12 an A.O.Smith motor is shown lying on its side with a screwdriver jammed through the ventilation holes into the plastic fan, a sure way to break the fan and ruin the motor. I am sure that had the manufacturer been consulted they would have recommended that the motor shaft be held with a $^{7}/_{16}$" open–end wrench placed on the flat at the rear end of the shaft just forward of the centrifugal member of the start switch.

p120 When attempting to explain how the sizing of a sand filter is arrived at, Mr. Tamminen (rhetorically?) asks "does some engineer measure the surface area of the billions and billions of grains of sand in a given filter to arrive at the total square footage of filtration area? I don't know..." He also doesn't know that a sand filter is measured by the area of a horizontal cross section of the sand bed and not the surface area of each grain of sand. In other words the square footage of a typical (round) sand filter is arrived at by the simple formula πr^2. In the case of the common 24" diameter sand filter (with a radius of 12" or 1 foot):

πr^2

or 3.14 x 1 x 1

or 3.1 square feet

p135 When addressing the maintenance of a closed, pressure DE filter (Purex) — Mr. Tamminen states that after backwashing "you'll be backwashing again in a few days or weeks." While this statement is only a personal prejudice I must state that it goes against not only the manufacturer's recommendations but my personal experience also. I have systems that I backwash religiously every six months and disassemble to clean every two to three years. When disassembled they show minimal problems from bridging or caking of the DE. In my experience the results of backwashing a DE filter depend mostly on the size of the filter or the required flow rate for backwashing in relation to the output of the pump. In other words if the pump and filter are properly matched there is no problem in backwashing, but if the filter has been over–sized so that it only needs backwashing every six months or so then the output of the pump is probably insufficient to properly clean the filter. There is also an undesirable side effect of frequent disassembly of the filter, that being unnecessary wear on the elements.

p139 Mr. Tamminen recommends opening a sand filter after every third backwash. That practice, if indeed it is practiced anywhere, is absolutely unheard of in this (the Tucson) area – an area known for a predominance of sand filters. Other remarks about sand filters, including the implication that only rotary valves are used on sand filters because the sand can't "float" out with the backwash water, and that regular teardown is performed to "check to see if the regular backwashing has flushed out too much sand" indicate that Mr. Tamminen is not familiar with today's sand filter technology and could use some technical editing when referring to them.

p146 Mr. Tamminen states that the spring–loaded internal by–pass valve is designed to "keep the temperature in the exchanger from becoming excessive." Without this way for water to by–pass the heat exchanger the exchanger would run too cold. The by–pass is used to increase the range of acceptable water flow so that the heater is less sensitive to changes in water flow, caused usually by a dirty filter or basket, or by the cycling of valves for solar systems or automatic cleaners or spa jets, etc.

p151 In the book it is noted that remote controls for millivolt (mV) heaters—use "heavily insulated wiring to avoid heat loss." Here the problem lies in the misconception that it is "heat loss" that we must avoid, when it is actually voltage loss that we are concerned about. While excessive amperage traveling through a wire will generate heat, insulating the wire (against heat loss) will only cause further voltage loss because a hotter wire has *more* resistance and causes yet more voltage loss. The only worry we have relating to the insulation is that it is adequate to insulate the voltage carried by the wire from anything that the wire might be in contact with. What we need to do is to use a wire of large enough gauge to carry the amperage with a minimal voltage loss, and to use stranded wire, because the voltage from a pilot generator cartridge is direct current – which travels on the surface of a wire. Stranded wires have more surface area than solid wires of the same gauge.

p152 Mr. Tamminen claims that the heater thermostat bulb is positioned "where it can sense the temperature of the water coming out of the heater." Actually, all heater thermostats sense the temperature of *incoming* water. Anyone who has encountered a heater that was installed with the water plumbing connections reversed knows that the primary resultant symptom will be a heater that cycles on and off. This occurs when the heated water leaves the heater through the inlet pipe and encounters the thermostat – causing the thermostat to open, and shut the heater down.

Moments later the heater will fire again after the heat exchanger and the water passing through it have cooled enough for the thermostat to close again.

p156 Mr. Tamminen claims that, with an IID heater—pilot "heat generates a current that is sensed by the IID." Actually, the current is produced in the IID and sent through the ignition wire to ground. It is of too small a voltage to jump the spark gap at the end of the ignition wire so it cannot pass to ground. Once the pilot is ignited the small voltage is able to pass through the flame or plasma to ground because the flame touches both the spark electrode and the ground. Even when the IID is trying to ignite the pilot with a high–voltage spark it is able to sense whether or not this small voltage is able to pass to ground or not and therefore whether or not the pilot is ignited.

p300 When referring to recycling pool water while draining pools in the arid southwest Mr. Tamminen states that "you can pump for a few hours a day and drain the pool over a week or two," a practice that is sure to damage if not ruin pool plaster by allowing excessive drying, which leads at best to plaster shrinkage and crazing and at worst to total delamination of the plaster.

p312 When referring to the process of replacing a skimmer where the size of the new skimmer doesn't match the old opening, Mr. Tamminen recommends that the service technician "cut the pool wall opening larger as needed." The pool wall at this location is part of the structural bond–beam of the pool. To cut some of it away is the equivalent of cutting into the frame of an automobile and then still expecting it to carry the same load as before. Cutting away any steel in this area could well be catastrophic, causing structural cracks. Even if no steel is removed, the structure will be weakened, and steel may be left undetected too close to the surface of the concrete – leading to rusting and rust bleeding through the tile grout. It would be far better to leave the opening alone and find a skimmer that fits, or to adapt the skimmer to the hole – not the other way around.

p334 Mr. Tamminen claims that "acid washing... leaves [plaster] smoother than before". Acid washing may in some cases leave plaster smoother than it was, as in the rare case where the acid removes a rough calcium build–up without attacking the surrounding plaster, but under normal circumstances acid washing is an etching process that generally can only roughen a surface.

p358 Here, Mr. Tamminen mentions two suction lines in one main drain, with no mention of maximum flow rates. This is an unsafe installation that can lead to drowning by entrapment, and is an open invitation for personal injury and a possible liability suit.

p384–5 Mr. Tamminen includes a diagram and description of a pressure–type automatic gas chlorinator, an antiquated and, I believe, no longer produced system – and he then goes on to suggest that you may try to repair automatic gas chlorinators yourself after first watching a factory–trained technician work on such a system.

p399 Mr. Tamminen states that, were you to touch a properly grounded motor with an internal short circuit to the motor case, you would be shocked – when in fact you would not receive a shock unless the ground wire was broken (and, if the motor was bonded, the bond wire was also bad).

p401 and 403 Mr. Tamminen incorrectly identifies the two legs of a single phase 220 volt system as two phases. The legs are actually in the same phase.

p437 In the Glossary, Mr. Tamminen describes acid demand as "the amount of acid required ... to *raise* the pH" (italics added) when in fact acid *lowers* pH. Base demand is the indicator of the amount of material required to raise pH, but base demand is not included in the Glossary.

Conclusion

It is my sincere desire to see a second edition of this book, and soon. I hope that Mr. Tamminen can take both the praise and the criticism he receives to heart, and continue working on this project. Although this review is not designed to list each and every mistake (both from constraints of space and interest) enough of an overview of the errors has been included to illustrate the necessity for competent, professional editing. If the errors can be acknowledged and corrected, Mr. Tamminen will have a top–notch textbook that we can all use for our own benefit, for the training of our employees, and for the education of a few of our more interested customers.

About the Author

Tom Hickey is the owner/president of Hickey Custom Pools in Tucson, Arizona. He was the first NSPI Certified Technician in Southern Arizona. As a member of the Board of Directors of the Southern Arizona Chapter of NSPI, he is responsible (among other things) for teaching portions of the Tech program courses. He has worked in the pool industry for 21 years, as a repair technician, a manager of a swimming pool parts distribution company, a pool construction manager, and currently as the owner of a small repair and remodeling company.